

# BUTZEL LONG TIGHE PATTON PLLC

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Ms. Marlene H. Dortch  
Secretary, Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

Re: *Ex Parte* Submission  
GN Docket Nos. 09-47, 09-51, 09-137, and RM-11358

Dear Ms. Dortch:

ADTRAN, Inc. (“ADTRAN”) is submitting this letter to address one issue that impacts the Commission’s decision regarding the retirement of copper loops and sub-loops that has been raised in the above-captioned proceedings – newer technologies that have greatly enhanced the capabilities of broadband services offered over copper loops. ADTRAN, founded in 1986 and headquartered in Huntsville, Alabama, is a leading global manufacturer of networking and communications equipment, with an innovative portfolio of solutions designed for use in the last mile of today’s telecommunications networks. ADTRAN’s equipment is deployed by some of the world’s largest service providers, as well as distributed enterprises and small and medium businesses. Importantly for purposes of these proceeding, ADTRAN solutions enable voice, data, video and Internet communications across copper, fiber and wireless network infrastructures. ADTRAN thus brings an expansive perspective to this issue.

Broadband services can be provided over a copper loop using Digital Subscriber Line (DSL) technologies. DSL technologies are continuing to evolve to take full advantage of the extensive base of copper loops that currently comprise much of the telecommunications plant in service. One means of increasing the capacity of the DSL service is to fully utilize the multiple copper loops that have already typically been deployed to most homes by “bonding” those loops. Using VDSL2 technology and two-pair bonded loops, broadband download speeds of 80 Mbps can be provided on loop lengths up to 2500 feet. Alternatively, using ADSL2+ technology and two-pair bonded loops, the subscriber can get download speeds of 25 Mbps on loop lengths of up to 10,000 feet. And where there are additional loops (which may be the case for some

residences, or for broadband service to businesses or to remote terminals), multi-pair bonding can be used to provide hundreds of Mbps download speeds.

One of the problems limiting DSL performance is crosstalk between the loops within the same binder group in the network. A solution to crosstalk is vectoring, which uses advanced signal processing techniques to mitigate crosstalk. By performing the signal processing jointly among a group of lines at the DSL Access Multiplexer (DSLAM), rather than performing the signal processing on a line-by-line basis, the crosstalk can be significantly reduced or eliminated, thereby increasing capacity. Using vectoring, DSL download speeds of 100 Mbps can be provided on loops of up to 1000 feet over a single copper loop pair, or that same speed can be provided at up to 2500 feet with two-pair bonding. Thus, while vectoring provides significant enhancements on relatively short copper loops, it does allow service on those loops at the 100 Mbps download speeds suggested as a longer term goal under the Commission's National Broadband Plan. And, advances in Outside Plant DSLAMs (OSP DSLAMs) are making it more economical to limit the length of the DSL loops to the customer premises.

Vectoring requires a system-level approach in order to allow the signal processing to be performed across the copper loop pairs in the binder group. The need for system-level signal processing does not mean, however, that vectoring is only possible if a single operator is providing service over the copper pair loops in the binder group. Through communication and coordination, it is possible to have multiple OSP DSLAMs or chassis cards work together as a "system" to support vectoring.

These newer DSL technologies are being deployed as a means of providing an economical path to achieving broadband service at speeds capable of supporting current and future applications. Indeed, there have been some estimates that 80-90% of new broadband deployment in Europe will be provided using vectored DSL technologies, rather than fiber-to-the-home.<sup>1</sup>

In addition to broadband DSL, ADTRAN continues to invest and develop innovative Business Ethernet solutions to enable the ubiquitous deployment of high-speed Ethernet services to businesses over copper pairs, TDM (copper-based T1 circuits) and fiber optics. Many of our service provider customers have launched nationwide Ethernet service offerings using these state-of-the-art copper and TDM-based solutions. On October 4, 2012, ADTRAN announced a new product that uses a breakthrough technology called "ActivReach."<sup>2</sup> Solutions based on ActivReach allow service providers to deliver 100 Mbps of Ethernet services at three times the

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<sup>1</sup> See, e.g., <http://fastnetnews.com/dslprime/42-d/4845-dsl-tsunami-rolling-over-europe-first-look>.

<sup>2</sup> <http://activreach.adtran.com/>

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distance over legacy voice grade wiring in older and historic buildings. The majority of these technology innovations are focused on copper distribution where the economics for fiber optics and other technologies are the most challenging.

As demonstrated by these continuing advances in technology, when deciding what policies to apply to retired copper loops, the Commission must be mindful that copper loops are not an anachronism, but instead can be a robust component of broadband service providers' "tool chest." Please contact the undersigned if you have any questions with regard to this matter.

Sincerely,

/s/

Stephen L. Goodman  
Counsel for ADTRAN, Inc.

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